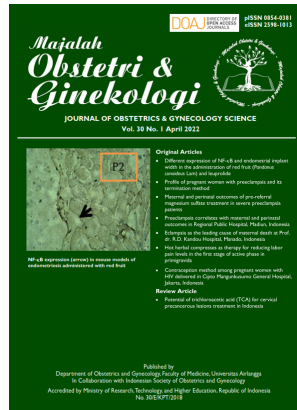




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## Keywords

**ORIGINAL ARTICLE****Profile of pregnant women with preeclampsia and its termination method**Vebianti Permadi<sup>1</sup>, Aditiawarman<sup>2</sup>, Pudji Lestari<sup>3</sup>

<sup>1</sup>Midwifery Study Program, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia. <sup>2</sup>Department of Obstetrics and Gynecology, Faculty of Medicine, Universitas Airlangga, Dr Soetomo General Academic Hospital, Surabaya, Indonesia, <sup>3</sup>Department of Public Health and Preventive Medicine, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

**ABSTRACT**

**Objectives:** To determine the symptoms of pregnant women with preeclampsia through the method of pregnancy termination.

**Materials and Methods:** This study used a cross-sectional method for descriptive analysis. The total sample included 75 pregnant women with preeclampsia. The sampling techniques was carried out with purposive sampling. This study used auxiliary data in medical records of preeclampsia mothers who gave birth at Taman Husada Regional Hospital, Bontang, Indonesia, in 2019.

**Results:** The results showed that most preeclampsia mothers delivered by cesarean section (CS). Among mothers who gave birth by cesarean section, there were severe symptoms of preeclampsia, 74.14% had severe hypertension with systolic blood pressure of  $\geq 160$  mmHg or diastolic blood pressure of  $\geq 110$  mmHg. Those with severe proteinuria with urine protein  $\geq 2g/24$  hours or  $\geq +2$  were 82.76% and 60.35% of those complained visual impairment with blurred vision.

**Conclusion:** These data indicated that most mothers with preeclampsia gave birth by cesarean section and exhibited severe symptoms of preeclampsia.

**Keywords:** preeclampsia; termination method; cesarean section; hypertension; proteinuria; blurred vision; maternal health

**ABSTRAK**

**Tujuan:** Untuk mengetahui gejala ibu hamil preeklampsia serta metode terminasi kehamilan.

**Bahan dan Metode:** Analisis deskriptif menggunakan metode cross-sectional. Sampel diambil sebanyak 75 ibu hamil preeklampsia dan menggunakan metode target sampling. Penelitian ini menggunakan data sekunder berupa rekam medis ibu preeklampsia yang melahirkan di RSUD Taman Husada, Bontang, Indonesia, tahun 2019.

**Hasil:** Hasil penelitian menunjukkan bahwa sebagian besar ibu preeklampsia melahirkan dengan operasi bedah sesar (SC). Pada ibu preeklampsia dengan operasi bedah sesar, ditemukan gejala preeklampsia berat (PEB): Hipertensi berat dengan tekanan darah sistolik  $\geq 160$ mmHg atau tekanan darah diastolik  $\geq 110$  mmHg yaitu 74,14%; proteinuria berat dengan protein urin  $\geq 2g/24$  jam atau  $\geq +2$  sebanyak 82,76% dan 60,35% orang menderita penglihatan yang buruk.

**Simpulan:** Data menunjukkan bahwa sebagian besar ibu dengan preeklampsia melahirkan dengan operasi bedah sesar dan menunjukkan gejala preeklampsia yang parah.

**Kata kunci:** preeklampsia; metode terminasi; bedah sesar; hipertensi; proteinuria; gangguan penglihatan; kesehatan ibu

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## INTRODUCTION

Preeclampsia is a pregnancy-specific disease characterized by placental dysfunction and the maternal response to systemic inflammation through endothelial activation and coagulation. The diagnosis of preeclampsia is confirmed by the presence of hypertension caused by pregnancy and other organ system diseases that occur over 20 weeks of gestation.<sup>1</sup> Severe preeclampsia can be diagnosed with one or more of the following findings: systolic blood pressure of 160 mmHg or higher, diastolic blood pressure of 110 mmHg or higher, thrombocytopenia, and liver function impairment when liver enzyme levels are elevated. Patients with renal insufficiency have higher blood creatinine levels (1.1 mg/dL), pulmonary edema, and insufficiency in patients with brain and visual impairment.<sup>2</sup>

In a retrospective cohort study published in August 2017, 5506 women with preeclampsia underwent a cesarean section at 34 weeks of pregnancy. Among them, 5104 (92.7%) women received cesarean section, and 402 (7.3%) women received cesarean section. However, during the monitoring process, of the 5104 women undergoing labor induction, 3450 (67.6%) women gave birth vaginally and 1654 (32.4%) women continued cesarean section. Therefore, the total number of women with preeclampsia who underwent cesarean section was 2,057 women.<sup>3</sup>

Regardless of the indications considered, this number is high when considering the morbidity associated with cesarean section. The general belief that cesarean section is safe without side effects has shown contrasting evidence, especially in regard to future complications of subsequent pregnancy.<sup>2</sup> Therefore, it is necessary to take preventive measures so that the complications of cesarean section indications do not occur in preeclampsia. This is the role of health practitioners to identify risk factors for preeclampsia, provide control, and recognize the clinical symptoms of preeclampsia, so that early referral is possible, in an effort to prevent the deterioration of preeclampsia.<sup>1</sup>

Factors still associated with severe maternal morbidity include the diagnosis of hemolysis, elevated liver enzymes and postnatal syndrome of hemolytic liver enzyme low platelet elevation (HELLP) (nearly four times higher risk) and cesarean section (almost doubled increased risk). Pregnant women with severe preeclampsia are more likely to have cesarean section, but when it is significantly associated with postpartum maternal morbidity, induction of labor should be considered a better option for these women.<sup>2</sup> Another study stated that in women with preeclampsia at 34 weeks of gestation or later (172 women who underwent

induction labor and 21 women by planned caesarean), there was no statistically significant difference in the composite adverse maternal outcome (liver/renal failure, thrombocytopenia, disseminated intravascular coagulation, pulmonary edema, eclampsia, blood transfusion, stroke), but induced labor had a higher risk of ICU hospitalization than cesarean section (ICU hospitalization; 16.3% with induction and 9.5% with planned caesarean delivery).<sup>2</sup> Therefore, it is necessary to take preventive measures so that preeclampsia does not occur with complications that are an indication of cesarean section.

This study focused on understanding the profile of pregnant women using the pregnancy termination method at Taman Husada Regional Hospital in Bontang, Indonesia. Various indicators studied included blood pressure, urine protein, platelets, and visual disturbances which are signs of preeclampsia in pregnant women.

Various studies have shown that preeclampsia often results to a cesarean section. A study by Amorim et al. (2015) found that 59% of women with severe preeclampsia required a cesarean section.<sup>4</sup> Cesarean section is carried out to maintain the health of the fetus, avoid the risk of the fetus, and fetal death by using termination method.<sup>5</sup>

The American College of Obstetrics and Gynecology Task Force on Hypertension (ACOG) stated that the type of delivery should be determined by gestational age, fetal performance, cervical condition, and the condition of the mother and fetus.<sup>6</sup> Compared with induction of labor, planned cesarean section is not related to the increased risk of the main outcome (thromboembolism, blood transfusion, and hysterectomy), but it is related to the increased risk of entering the maternal intensive care unit and neonatal risk. Therefore, several other researchers support the recommendation that preeclampsia does not require cesarean section.<sup>7</sup>

On this basis, it is necessary to describe the symptoms of pregnant women with preeclampsia by means of termination of pregnancy. Therefore, pregnant women with preeclampsia have a higher risk of cesarean section, which can be detected early and treated immediately, so preeclampsia will not worsen and vaginal delivery can be performed.

This study may increase the knowledge and role of health practitioners in identifying and controlling the risk factors for preeclampsia, as well as recognizing the its clinical symptoms, so that it is possible to make referrals for early treatment in an effort to prevent



worsening preeclampsia conditions to reduce morbidity and mortality of the mothers.

## MATERIALS AND METHODS

In this study, a cross-sectional descriptive analysis method based on medical records was used to determine the symptoms of pregnant women with preeclampsia by means of pregnancy termination. The population of the study included pregnant women with preeclampsia who gave birth at the Taman Husada Regional Hospital in Bontang, Indonesia, in 2019. The sampling method was carried out with a targeted sampling method, and a sample of 75 mothers was obtained. This study used auxiliary data in the form of maternal medical records. The inclusion criteria were all pregnant women with preeclampsia who gave birth at Taman Husada Regional Hospital in Bontang, Indonesia, singleton pregnancy, and no comorbidities and obstetric diseases.

The research was performed through several steps. The initial stage was to obtain research permits from the Faculty of Medicine, Universitas Airlangga, Surabaya and Taman Husada Regional Hospital, Bontang, Indonesia, and then to obtain research subjects in the form of medical records and registration data records from the medical records department. The functional medical staff of the Obstetrics and Gynecology Department of Taman Husada Regional Hospital, Bontang, Indonesia, checked the patients' medical records in the emergency room, especially in the delivery room, from January 1, 2019 to December 31, 2019. After all the data had been collected, data processing was performed.

Statistical data analysis was carried out descriptively with a frequency distribution table for each symptom variable for preeclampsia mothers (hypertension status, proteinuria and visual disturbances) who underwent vaginal delivery and cesarean section. Vaginal delivery data were also displayed so as not to bias the cesarean section data. Ethical clearance number: 202/EC/KEPK/FKUA/2020 for this study was issued on Agustus 19, 2020, by Health Research Ethics Committee, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia.

## RESULTS AND DISCUSSION

Based on the registration of the Medical Record Department of Taman Husada Regional Hospital in Bontang, Indonesia, from January 1 to December 31, 2019, the total cases of preeclampsia was 82, 75 mothers gave birth by cesarean section, 17 mothers gave birth by vaginal delivery. There were 75 samples that fulfilled the inclusion and exclusion criteria, consisted of 58 samples in cesarean section and 17 cases in vaginal delivery. Eight mothers with preeclampsia did not fulfill the criteria due to fetal distress, history of cesarean section, and fetal position abnormalities.

Based on [Table 1](#), most preeclamptic mothers gave birth by cesarean section. The cesarean group (74.14%) had symptoms of severe hypertension with systolic blood pressure  $\geq 160$  mmHg or diastolic blood pressure  $\geq 110$  mmHg, while in group of preeclamptic women with vaginal delivery, most had mild hypertension symptoms. Groups of preeclamptic mothers with symptoms of hypertension and the method of delivery are described in [Figure 1](#).

Table 1. Frequency distribution of surveys based on hypertension symptoms at the Taman Husada Regional Hospital in Bontang, Indonesia, from January to December 2019.

Blood pressure	Frequency & percentage of each method of delivery (%)		Total & percentage (%)
	CS	Vaginal Delivery	
Mild hypertension (systolic blood pressure $\geq 140$ mmHg or diastolic blood pressure $\geq 90$ mmHg)	15 (25.86%)	14 (82.35%)	29 (45.33%)
Severe hypertension (systolic $\geq 160$ mmHg or diastolic $\geq 110$ mmHg)	43 (74.14%)	3 (17.65%)	46 (54.67%)
Total & percentage of method of deliveries	58 (100%)	17 (100%)	75 (100%)

Source: Medical records 2019

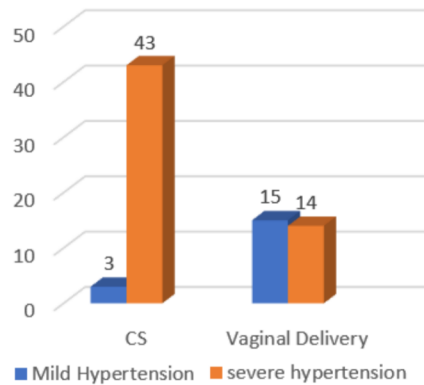


Figure 1. Symptoms of hypertension and method of delivery

Table 2. Frequency distribution of respondents based on proteinuria symptoms visited Taman Husada Regional Hospital, Bontang, Indonesia, from January to December 2019.

Urine protein	Frequency & percentage of each method of delivery (%)		Σ all PE mothers & percentage (%)
	CS	Vaginal Delivery	
Mild proteinuria (Urine protein 300 mg / 24 hours or +1)	10 (17.24%)	14 (82.35%)	24 (32%)
Severe proteinuria (urinary protein ≥ 2 g / 24 hours or ≥ +2)	48 (82.76%)	3 (17.65%)	51 (68%)
Total & Percentage of method of delivery	58 (100%)	17 (100%)	75 (100%)

Source: Medical record in 2019

Table 2 shows that mothers with preeclampsia who underwent cesarean section had symptoms of severe proteinuria, as many as 48 patients (82.76%) and mild proteinuria as many as 10 patients (17.24%), while

preeclamptic mothers who underwent vaginal delivery mostly had mild proteinuria symptoms. Groups of preeclamptic mothers with symptoms of proteinuria and the method of delivery are described in Figure 2.

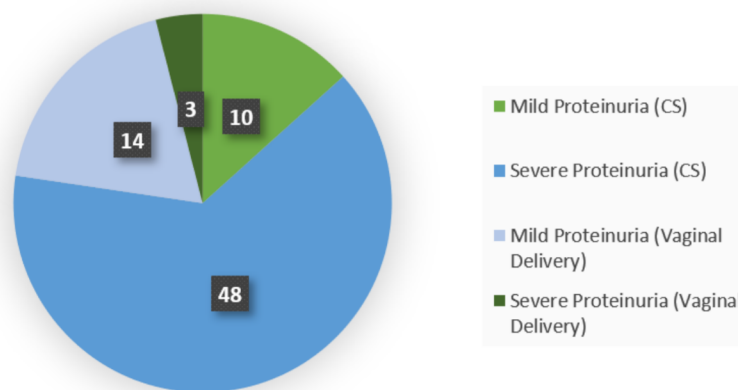


Figure 2. Symptoms of proteinuria and methods of delivery

Table 3. Frequency distribution of respondents based on visual impairment symptoms at Taman Husada Regional Hospital, Bontang, Indonesia, from January to December 2019

Visual Disturbance	Frequency & Percentage of Each Method of Delivery (%)		Total & Percentage (%)
	CS	Vaginal Delivery	
No visual disturbances present (No complaints of blurred vision)	23 (39.66%)	14 (82.35%)	37 (49.33%)
Visual disturbances present (in form of blurred vision)	35 (60.34%)	3 (17.65%)	38 (50.67%)
Total & percentage of method of deliveries	58 (100%)	17 (100%)	75 (100%)

Source: Medical record 2019

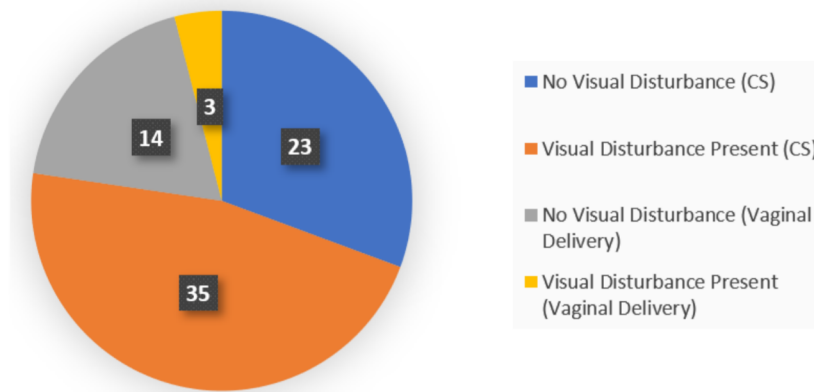


Figure 3. Symptoms of visual disturbance and method of delivery

Table 3 shows that preeclamptic mothers with cesarean section mostly experienced visual disturbances, in the form of blurred vision, as many as 35 mothers (60.34%) and the remaining 23 mothers (39.66%) had no complaints of blurred vision. Meanwhile, preeclamptic mothers that underwent vaginal delivery mostly did not have complaints of blurred vision. Preeclamptic mothers with symptoms of visual disturbances and the method of delivery are described in Figure 3.

The results of the study listed in Table 1 showed that most preeclamptic mothers who delivered using cesarean section had symptoms of severe hypertension. These data were consistent with a study carried out by O'Brien et al. after reviewing 178 cases of pregnant women during their imminent time of delivery and found that 58 (32.6%) of the patients were confirmed of having severe blood pressure. Of the 58 cases, 46 (79.3%) received a diagnosis of preeclampsia with severe features, and the majority of 38 (65.5%) patients underwent cesarean section.<sup>8</sup> Syahriana in his study stated that pregnant women with pregnancy-induced hypertension were at three times the risk of cesarean

section compared to mothers who had normal blood pressure.<sup>9</sup>

Hypertension conditions will force the kidneys to work harder, resulting in cell damage which is indicated by the presence of proteinuria. Proteinuria is the presence of protein in human urine whose level exceeds the normal limit, which is >150mg/24 hours.<sup>10</sup> When left untreated, this condition will not only cause kidney problems, but also kidney damage. Therefore, it is necessary to quickly and accurately treat preeclampsia with high proteinuria as one of the symptoms of severe preeclampsia.

Table 2 of all preeclamptic mothers who delivered using cesarean section, most mothers experienced symptoms of severe proteinuria. These results were in line with the study carried out by Ozkara et al. after evaluating preeclamptic mothers. The results of cesarean section rates in patients in group 1 (300-1,000 mg/day), group 2 (1,001-3,000 mg/day) and group 3 ( $\geq$  3,001 mg/day) were 87.5%, 75.7%, and 85.7% respectively, while the normal vaginal birth rates in the same group were found to be 12.5%, 24.3% and 14.3%, respectively.<sup>11</sup>

Another pregnancy complication that occurs in mothers with preeclampsia is visual disturbances. In [Table 3](#) we observe a high frequency of preeclamptic mothers with cesarean section experiencing blurred vision, indicating that visual disturbances are one of the symptoms of preeclamptic mothers with risk for cesarean section. This finding was also in line with the result of a study by research conducted by Radha Bai Prabhu et al. at the Special Government Hospital for Women and Children, Chennai, India, in which one of the rare complications of preeclampsia was the incidence of blindness. The incidence of blindness in women with preeclampsia and eclampsia was 0.17%. The causes of vision loss were cortical blindness in 14 patients and retinal detachment in two patients. Blindness was manifested mainly in the intrapartum and postpartum periods in 13/16 cases (81.25%). Seven patients (43.75%) were diagnosed with severe preeclampsia, and nine patients (56.25%) were diagnosed with eclampsia. Blindness that occurs during the antepartum period is an indication of immediate termination of pregnancy. In three of the patients, blindness occurred in the antepartum period, and they delivered by cesarean section within 12 hours.<sup>12</sup>

Increased blood pressure will affect blood flow, including in the eyes, resulting in vision problems. The common pathological change is swelling in the center of vision (macula). This occurs because of a leak in the lining of the eye nerve (retina), which then collects in the center of vision (central serous retinopathy). Generally, the symptom complained by the mother is a sharp decline in vision or a more blurred middle vision. This condition can improve on its own after childbirth. But in some cases, the vision does not return to normal condition, and there are even some cases of blindness.<sup>13</sup>

Another finding that was in line with our results was also carried out at the Medical Record Installation of Dr. M. Djamil, Padang, Indonesia, in December 2018-January 2019 with a sample of 77 preeclamptic mothers. From this study, it was found the highest levels of proteinuria in patients with preeclampsia and eclampsia were +2 with a percentage of 39.0%. In this group, 43.3% had normal ocular fundus, and 56.7% had positive ocular fundus changes. Mild preeclamptic ocular fundus was the most common finding in the +2 proteinuria group, as much as 50%.<sup>14</sup>

This study revealed that among all mothers with preeclampsia, most received cesarean section and a small percentage received a vaginal delivery. Most of the mothers with preeclampsia who gave birth through cesarean section had symptoms of severe preeclampsia, ie. severe hypertension, severe proteinuria, and visual impairment with poor vision.

The data of this study were in accordance to an observational study by Amorim which showed that from 500 mothers with severe preeclampsia, 110 mothers (22.0%) had spontaneous labor, 141 mothers (28.2%) had induced labor, while 249 (49.8%) underwent elective cesarean section. However, of the mothers with induced labor, 95 (67.4%) gave birth vaginally, while the rest experienced failed induction and performed cesarean section instead. In total, 295 mothers underwent cesarean section or 59% of all severe preeclamptic mothers. Amorim argued that caesarean section was common in women with severe preeclampsia and was associated with significant postpartum maternal morbidity.<sup>15</sup>

One possible treatment for preeclampsia is childbirth. In theory, the benefits of immediate termination of pregnancy by cesarean section would be even greater. When severe preeclampsia occurs before 34 weeks and the cervix is not supported, a longer induction time can be expected. At the same time, maternal complications may appear or worsen. The health of the fetus is also worrying, because abnormal placental function may lead to fetal distress and fetal death.<sup>5</sup>

However, there was another study whose results did not support the finding of this study. It was a population-based case-control study conducted in eight Brazilian states. The research was derived from a large-scale birth study in Brazil (the 2011 national survey that included 9221 postpartum women). It was found that the postpartum mortality risk of cesarean section women was nearly three times higher than that of vaginal delivery. This was mainly due to mortality and complications of anesthesia caused by postpartum hemorrhage.<sup>15</sup>

The researchers' of the study believed that it was important to consider the level of morbidity and mortality when determining the delivery management of preeclampsia. The symptoms of preeclampsia are not only exacerbated, leading to other comorbidities, but future complications caused by the birth process and subsequent pregnancy must also be considered.

In this study, the number of cases of preeclampsia was high. This was because the study site was a referral hospital, and most patients had experienced obstetric complications, on which medical decisions for the obstetric indications were based.

## CONCLUSION

Most pregnancy of the mothers with preeclampsia at Taman Husada Regional Hospital in Bontang,

Indonesia, were terminated by cesarean section, while a small percentage of mothers terminated their pregnancy through vaginal delivery. Most mothers with preeclampsia who gave birth by cesarean section have descriptions of the symptoms of severe preeclampsia, that is, severe hypertension, severe proteinuria, and visual impairment caused by poor vision. The results of this study can be used as a reference for formulating prevention plans and solving preeclampsia problems, such as screening and early detection of preeclampsia symptoms to better manage the disease, thereby reducing morbidity, mortality and delivery with cesarean section.

### CONFLICT OF INTEREST

All authors declare that they have no conflicts of interest.

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